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| APPLICATION NO. | FILING DATE | FIRST NAMED INVENTOR | ATTORNEY DOCKET NO. | CONFIRMATION NO. |
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| 10/651,104 | 08/29/2003 | Ik-Soo Kim | 8733.432.20 | 7746 |
| 30827 | 7590 | 03/21/2005 | EXAMINER | |
| MCKENNA LONG & ALDRIDGE LLP | | | DI GRAZIO, JEANNE A | |
| 1900 K STREET, NW | | | ART UNIT | |
| WASHINGTON, DC 20006 | | | PAPER NUMBER | |
| | | | 2871 | |

DATE MAILED: 03/21/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

| | | |
|---------------------|--------------|--|
| Application No. | Applicant(s) | |
| 10/651,104 | KIM, IK-SOO | |
| Examiner | Art Unit | |
| Jeanne A. Di Grazio | 2871 | |

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 16 December 2004.
- 2a) ☒ This action is FINAL.
- 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under Ex parte Quayle, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 29-47 is/are pending in the application.
- 4a) Of the above claim(s) 47 is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 29-46 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 29 August 2003 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 - 2. ☒ Certified copies of the priority documents have been received in Application No. 09/860,590.
 - 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____

DETAILED ACTION

Status of Claims

Per Preliminary Amendment filed August 29, 2003, claims 1-28 have been cancelled. Claims 29-47 are pending. Claim 47 has previously been withdrawn from further consideration per Applicant's election without traverse of Species B, second preferred embodiment (Figure 13) claims 29-46 readable thereon in the reply filed on July 2, 2004.

Applicant has amended claims 29, 34, 35 and 43-45 per Amendment dated December 16, 2004.

Priority

Priority to Korean Patent Application No. 2000-27850 (May 23, 2000) is claimed. Continuation of Application No. 09/860,590 filed on May 21, 2001 now United States Patent 6,661,492.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 29-33 and 37-42 are rejected under 35 U.S.C. 103(a) as being unpatentable over United States Patent 6,351,300 B1 (to Park et al.) in view of United States Patent 6,014,190 (to Kim et al.) and further in view of United States Patent 6,122,030 (to Nagata et al.).

As to claim 29, Park teaches and discloses a reflective LCD having a high transmittance and manufacturing method and Park has the following elements. Park has, referring to Figures 2 and 3, a lower substrate (40) and an upper substrate (60), gate bus lines (41a and 41b) and a common signal line (42) on the lower substrate (40), data bus lines (47a and 47b) perpendicular to the gate bus lines (41a and 41 b), a thin film transistor (50) at a crossing point of the gate (41a and 41b) and data (47a and 47b) bus lines, the thin film transistor (50) including a source electrode (48), a drain electrode (49) and a gate electrode (45), a gate insulating layer (44) over the gate bus lines (41a and 41b), an intermetal insulating layer (80) (= "second insulating layer") is deposited over the gate insulating layer (44) over the lower substrate (40), pixel electrodes (46) on the intermetal layer (80) (= "second insulating layer"), counter electrodes (43) on the intermetal layer (= "second insulating layer"), wherein the counter electrodes (43) and the pixel electrodes (46) form an alternating pattern (Figure 2), the counter electrodes (43) including an outermost counter electrode (43b) adjacent to a data bus line (47a and 47b), and a liquid crystal layer (65) between the lower and upper substrates (40 and 60 in Figure 1).

Park does not appear to explicitly specify that the outermost counter electrode and the data bus line are on different layer and wherein a portion of the outermost counter electrode overlaps the data bus line.

Kim teaches and discloses an in-plane switching liquid crystal display and manufacturing method (Title, entire patent). With reference to Figure 3, Kim teaches transparent common

electrodes (121) that are arranged within a column. An outermost common electrode (the first common electrode at the very top of Figure 3) overlaps with a data line (130). Specifically, the data line overlaps with the common electrodes in a column and edges of the data line lie within the width of the common electrodes. Furthermore, the common electrodes have openings (20) to prevent the signal flowing along the data line from disturbing the signal from the common electrodes (Column 5, Lines 45-60) (Applicant's "a portion of the outermost common electrode overlaps the data line"). The common electrodes and the data line being overlapped are on different layers (Column 3, Lines 28-36).

Kim teaches that because the data line and common electrode overlap, the electric fields due to the potential difference between the data line and the common electrodes are vertical and thus the fields rarely disturb the liquid crystal molecules particularly when the width of the common electrode is larger than that of the data line (Kim, Column 5, Lines 55-60).

Kim is evidence that ordinary workers in the field of liquid crystals would have found the reason, suggestion and motivation to overlap a data line and common electrode so that liquid crystal molecules would not be disturbed by electric fields generated from the potential difference of the data line and common electrode.

Therefore, it would have been obvious to one of ordinary skill in the art of liquid crystals at the time the invention was made to modify Park in view of Kim so as not disrupt liquid crystal molecules due to the potential difference between the data line and the common electrode and for a high aperture ratio device (Column 5, Lines 55-60 and Column 6, Lines 16-21).

Park does not appear to explicitly specify that the second insulating layer is made of an organic material.

Nagata teaches and discloses an insulating film layer and sealant arrangement for protective circuit devices in a liquid crystal display device (Title, entire patent) wherein an insulating film of an organic material is preferred in order to prevent longitudinal crosstalk (Column 1, Lines 60-67 and Column 2, Lines 1-8).

Nagata is evidence that ordinary workers in the field of liquid crystals would have found the reason, suggestion and motivation to incorporate an organic material for the second insulating layer to prevent longitudinal crosstalk.

Therefore, it would have been obvious to one of ordinary skill in the art of liquid crystals at the time the invention was made to modify Park in view of Nagata to prevent longitudinal crosstalk.

As to claim 30, the pixel electrodes are transparent (Park, Column 4, Lines 59-61).

As to claim 31, the pixel electrodes are made of indium tin oxide (ITO) (Park, Column 4, Lines 59-61).

As to claim 32, the counter electrodes are transparent (Park, Column 4, Lines 59-61).

As to claim 33, the common electrodes are made of indium tin oxide (ITO) (Park, Column 4, Lines 59-61).

As to claims 37-42, the method steps of fabricating an in-plane switching liquid crystal display device would have been obvious in view of the structures and devices as taught by Park in view of Kim and Nagata.

Claims 34 and 43-44 are rejected under 35 U.S.C. 103(a) as being unpatentable over United States Patent 6,351,300 B1 (to Park et al.) in view of United States Patent 6,014,190 (to

Kim et al.) and further in view of United States Patent 6,122,030 (to Nagata et al.) and further in view of United States Patent 6,486,933 B1 (to Cha et al.).

As to claim 34, Park does not appear to explicitly specify an auxiliary common electrode on the second insulating layer, the auxiliary common electrode contacting respective first ends of the common electrodes and contacting the common line via a contact hole through the first and second insulating layers.

Cha teaches and discloses a liquid crystal display for preventing vertical cross-talk and having overlapping data lines (Title, entire patent). Cha has secondary common electrodes and that contacts a common line through contact holes and thus reduces cross-talk (Column 6, Lines 8-19 and entire patent).

Cha is evidence that ordinary workers in the field of liquid crystals would have found the reason, suggestion and motivation to include an auxiliary common electrode on the second insulating layer, the auxiliary common electrode contacting respective first ends of the common electrodes and contacting the common line via a contact hole through the first and second insulating layers to reduce cross-talk.

Therefore, it would have been obvious to one of ordinary skill in the art of liquid crystals at the time the invention was made to modify Park in view of Cha to reduce cross-talk.

As to claims 43 and 44, the method steps of fabricating an in-plane switching liquid crystal display device would have been obvious in view of the structures and devices as taught by Park in view of Kim and Nagata and Cha.

Claims 35 and 45 are rejected under 35 U.S.C. 103(a) as being unpatentable over United States Patent 6,351,300 B1 (to Park et al.) in view of United States Patent 6,014,190 (to Kim et

al.) and further in view of United States Patent 6,122,030 (to Nagata et al.) and further in view of United States Patent 6,414,729 B1 (to Akiyama et al.).

As to claim 35, Park does not appear to explicitly specify an auxiliary pixel electrode contacting the pixel electrodes.

Akiyama teaches and discloses a liquid crystal display device having stacked pixel layers wherein an electrode of an auxiliary capacity electrode for a sub-pixel is connected to pixel electrodes (Column 7, Lines 46-48) and this structure contributes to shielding of the liquid crystal layers from scanning and signal lines (Column 2, Lines 15-25).

Akiyama is evidence that ordinary workers in the field of liquid crystals would have found the reason, suggestion and motivation to specify an auxiliary pixel electrode contacting the pixel electrodes to shield liquid crystal layers from scanning and signal lines.

Therefore, it would have been obvious to one of ordinary skill in the art of liquid crystals at the time the invention was made to modify Park in view of Akiyama to shield liquid crystal from scanning and signal lines.

As to claim 45, the method step of forming an auxiliary pixel electrode contacting the pixel electrodes would have been obvious in view of the structures and devices as taught by Park in view of Kim and Nagata and Akiyama.

Claims 36 and 46 are rejected under 35 U.S.C. 103(a) as being unpatentable over United States Patent 6,351,300 B1 (to Park et al.) in view of United States Patent 6,014,190 (to Kim et al.) and further in view of United States Patent 6,122,030 (to Nagata et al.) and further in view of United States Patent 5,680,190 (to Michibayashi et al.).

As to claim 36, Park does not appear to explicitly specify a capacitor electrode electrically connected with the pixel electrodes.

Michibayashi teaches and discloses a liquid crystal display in which three pixel electrodes are connected to each other through a capacitor for an enlarged view angle (Column 1, Lines 18-40).

Michibayashi is evidence that ordinary workers in the field of liquid crystals would have found the reason, suggestion and motivation to electrically connect a capacitor electrode with pixel electrodes for enlarged view angle.

Therefore, it would have been obvious to one of ordinary skill in the art of liquid crystals at the time the invention was made to modify Park in view of Michibayashi for enlarged view angle.

As to claim 46, the method step of forming a capacitor electrode electrically connected with the pixel electrodes would have been obvious in view of the structures and devices as taught and disclosed by Park in view of Kim and Nagata and Michibayashi.

Response to Arguments

Applicant's arguments filed December 16, 2004 have been fully considered but they are not persuasive.

Applicant's only two arguments are as follows:

(1) "[N]either Park, Kim, Nagata, nor Cha, analyzed alone or in any combination, teaches or suggests the combined features recited in the claims of the present application. For example, Park, Kim, Nagata, and Cha fail to teach or suggest an in-plane switching liquid crystal display

device that includes, among other features, 'a second insulating layer of an organic material over the first substrate; pixel electrodes on the second insulating layer; common electrodes on the second insulating layer, wherein the common electrodes and pixel electrodes form an alternating pattern' as recited in independent claim 1." (Remarks at page 10).

(2) " ... Further, Kim, Nagata and Cha fail to provide motivation to one of ordinary skill in the art to modify the device in Park to obtain an in-plane switching liquid crystal display device having the combined features recited in independent claim 1." (Id.).

The Examiner's response to Applicant's arguments are as follows:

(1) As previously noted, in the Non-Final Action of September 17, 2004, Park teaches and discloses (in Figures 2 and 3) "an intermetal insulating layer (80) (= "second insulating layer") is deposited over the gate insulating layer (44) over the lower substrate (40), pixel electrodes (46) on the intermetal layer (80) (= "second insulating layer"), counter electrodes (43) on the intermetal layer (= "second insulating layer"), wherein the counter electrodes (43) and the pixel electrodes (46) form an alternating pattern (Figure 2), the counter electrodes (43) including an outermost counter electrode (43b) adjacent to a data bus line (47a and 47b), and a liquid crystal layer (65) between the lower and upper substrates (40 and 60 in Figure 1)."

Nagata teaches and discloses that an organic material is preferred as a material for an insulating layer "in order to prevent longitudinal crosstalk (Nagata, Column 1, Lines 60-67 and Column 2, Lines 1-8)."

(2) Kim provides proper motivation to modify Park because Kim teaches and discloses "so as not disrupt liquid crystal molecules due to the potential difference between the data line

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and the common electrode and for a high aperture ratio device (Kim, Column 5, Lines 55-60 and Column 6, Lines 16-21).

Nagata provides proper motivation to modify Park because Nagata teaches and discloses that an organic material is preferred as a material for an insulating layer “in order to prevent longitudinal crosstalk (Nagata, Column 1, Lines 60-67 and Column 2, Lines 1-8).”

Furthermore, please note that Applicant’s recited method steps would have been obvious to one of ordinary skill in the art of liquid crystals at the time the invention was made in view of the devices as taught and disclosed by Park, Kim and Nagata and the other cited references.

Conclusion

THIS ACTION IS MADE FINAL. Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than **SIX MONTHS** from the mailing date of this final action.


Any inquiry concerning this communication or earlier communications from the examiner should be directed to Jeanne A. Di Grazio whose telephone number is (571)272-2289. The examiner can normally be reached on M-F.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Robert Kim, can be reached on (571)272-2293. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Jeanne Andrea Di Grazio
Patent Examiner
Art Unit 2871

JDG



TARIFUR R. CHOWDHURY
PRIMARY EXAMINER